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Resume of Remarks to NIAMDD Council Meeting - 16 November 1973

Our laboratory has initiated studies on the enzymology of Simian Virus 40 (SV40) DNA metabolism in permissive monkey kidney cells in tissue culture. Recent work from other laboratories suggested that this problem might now be amenable to study. First, the work of Salzman and coworkers and Nathan and coworkers has delineated the overall scheme of replication. Second, the work of Winocour and collaborators demonstrated the formation of SV40 DNA containing host DNA sequences substituted for SV40 sequences upon infection at high multiplicity, thus indicating that recombinational events may occur.

Our approach to this problem has been three-fold. First, we have compared DNase activities in nuclei from infected and uninfected cells. An assay was developed which permits detection of DNases making as little as a single nick in one strand of double-stranded covalently closed circulat SV40 DNA. No differences between infected and uninfected nuclei were found in enzymes detectable upon DEAE-cellulose chromatography. Two enzymes causing single nicks are being studied in detail. One appears similar to the DNase reported to be present in virions. The second activity is accompanied by a protein which can bind to SV40 DNA. Second, we have been studying the possibility that SV40 DNA may be synthesized upon the nuclear membrane. Preliminary evidence indicates that a significant percent of SV40 DNA labeled in a short pulse is associated with the so-called "M-Band." Thirdly, we are collecting data on the replication of the substituted SV40 DNA molecules and are attempting to elucidate the character of the host DNA sequences.